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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 10/679,517 | 10/07/2003 | Yasufumi Takagi | 046124-5240 | 8426 |
| 9629 | 7590 | 02/08/2005 | EXAMINER | |
| MORGAN LEWIS & BOCKIUS LLP 1111 PENNSYLVANIA AVENUE NW WASHINGTON, DC 20004 | | | | QUASH, ANTHONY G |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2881 | |

DATE MAILED: 02/08/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

| | | | |
|------------------------------|-----------------|---------------|--|
| Office Action Summary | Application No. | Applicant(s) | |
| | 10/679,517 | TAKAGI ET AL. | |
| | Examiner | Art Unit | |
| | Anthony Quash | 2881 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 12 October 2004.
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-7 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
 3) Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
 Paper No(s)/Mail Date _____.
- 4) Interview Summary (PTO-413)
 Paper No(s)/Mail Date. _____.
- 5) Notice of Informal Patent Application (PTO-152)
 6) Other: _____.

DETAILED ACTION

Applicants' amendment filed, 10/12/04, has overcome the objections listed in the last office action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Tsujimura [6,614,059]. As per claim 1, Tsujimura [6,614,059] discloses an illuminant which converts incident electrons into fluorescence, comprising a substrate (11 made of sapphire) being transparent with respect to the fluorescence, and a nitride semiconductor layer provided on and in direct contact with one surface of said substrate while covering the entire surface of said substrate, said nitride semiconductor layer having a quantum well structure that emits fluorescence in response to the electron incidence. See Tsujimura [6,614,059] abstract, figs. 1-2,6,9-10, col. 2 lines 1-20, col. 3 lines 20-30, col. 4 lines 1-15,50-60, col. 7 lines 1-40, col. 13 lines 40-45, col. 14 lines 1-15, and col. 18 lines 1-20.

Claims 1-2 are rejected under 35 U.S.C. 102(e) as being anticipated by Tsuda [6,399,966]. As per claim 1, Tsuda [6,399,966] discloses an illuminant which converts

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incident electrons into fluorescence, comprising a substrate (sapphire, see col. 5 lines 35-40) being transparent with respect to the fluorescence, and a nitride semiconductor layer provided on and in direct contact with one surface of said substrate while covering the entire surface of said substrate, said nitride semiconductor layer having a quantum well structure that emits fluorescence in response to the electron incidence. See Tsuda [6,399,966] abstract, figs. 1,8, col. 2 lines 8-67, col. 3 lines 45-55, col. 4 lines 5-25, col. 7 lines 30-40, column 10, col. 11 lines 20-24, col. 13 lines 5-20, col. 16 lines 10-67, col. 17 lines 15-20, 55-67, col. 18 lines 29-45, col. 20 lines 30-35, col. 21 lines 15-30,55-65, and col. 24 lines 30-45.

As per claim 2, Tsuda [6,399,966] discloses the well width of the quantum well structure being 4nm or less. See Tsuda [6,399,966] col. 11 lines 20-24, and col. 21 lines 55-60.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kondo [2004/0061054] in view of Tsuda [6,399,966]. As per claim 1, Kondo [2004/0061054] teaches a substrate being transparent with respect to the fluorescence, and a nitride semiconductor layer provided on one surface of the substrate, for emitting

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fluorescence in response to the electron incidence. See Kondo [2004/0061054] abstract, figs. 1, 7, 9-13, paragraphs [0003, 0005-0014, 0016-0025, 0045-0047, 0051-0055, 0059, 0078-0082, and 0136]. However, Kondo [2004/0061054] does not explicitly state that nitride layer having a quantum well structure. Tsuda [6,399,966] does teach the nitride layer having a quantum well structure. See Tsuda [6,399,966] abstract, figs. 1, 8, col. 2 lines 8-67, col. 3 lines 45-55, col. 4 lines 5-25, col. 7 lines 30-40, column 10, col. 11 lines 20-24, col. 13 lines 5-20, col. 16 lines 10-67, col. 17 lines 15-20, 55-67, col. 18 lines 29-45, col. 20 lines 30-35, col. 21 lines 15-30, 55-65, and col. 24 lines 30-45. Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to have the nitride layer contain a quantum well structure in order to allow a higher luminous efficacy as taught in Tsuda [6,399,966].

As per claim 2, Tsuda [6,399,966] discloses the well width of the quantum well structure being 4nm or less. See Tsuda [6,399,966] col. 11 lines 20-24, and col. 21 lines 55-60.

As per claim 3, Kondo [2004/0061054] teaches a photo-detector having sensitivity for fluorescence emitted from the illuminant. See Kondo [2004/0061054] abstract.

As per claim 4, Kondo [2004/0061054] teaches a photo-detector having a sensitivity with respect to fluorescence emitted from the illuminant, and a vacuum chamber including at least the illuminant installed inside, wherein the scanning electron microscope guides secondary electrons, which are generated from a sample disposed

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inside the vacuum chamber by scanning the surface of the sample with an electron beam, to the electron beam detector, and taking an image of the sample by making correspondence between the scanning position of the sample and the output of the electron beam detector. See Kondo [2004/0061054] abstract, figs. 1, 7,9-13, paragraphs [0003, 0005-0014, 0016-0025, 0045-0047, 0051-0055, 0059, 0078-0082, and 0136].

As per claim 5, Tsuda [6,399,966] discloses the well width of the quantum well structure being 4nm or less. See Tsuda [6,399,966] col. 11 lines 20-24, and col. 21 lines 55-60.

As per claim 6, Kondo [2004/0061054] teaches an electron beam detector including an illuminant, and a photo-detector having a sensitivity for fluorescence emitted from the illuminant, a vacuum chamber, including at least the illuminant installed inside, a separating section which spatially or temporally separates ions generated from a sample inside the vacuum chamber in accordance with masses of the ions, and a dynode to be irradiated with ions that have been separated at the separation section, wherein the secondary electrons, which are generated from the dynode in accordance with the incidence of ions onto the dynode, are guided to the electron beam detector and mass spectroscopy of the sample is carried out based on the output of the electron beam detector. See Kondo [2004/0061054] abstract, figs. 1, 7,9-13, paragraphs [0003, 0005-0014, 0016-0025, 0045-0047, 0051-0055, 0059, 0078-0082, and 0136].

As per claim 7, Tsuda [6,399,966] discloses the well width of the quantum well structure being 4nm or less. See Tsuda [6,399,966] col. 11 lines 20-24, and col. 21 lines 55-60.

Response to Arguments

Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection. With respect to applicants' request for the examiner to state how Kondo [2004/0061054] qualifies as prior art under 102 (e), the examiner would like to indicate to the applicants that Kondo [2004/0061054] qualifies as prior art under 102 (e) due to its filing date being earlier than applicants' earliest priority date.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Patent Nos. 5,998,925 to Shimizu et al, 6,580,215 to Nihashi, 5,684,309 to McIntosh et al., 2003/0173578 to Schaff et al., 2002/0074553 to Starikov et al. are considered pertinent to the applicants' disclosure. Shimizu [5,998,925] is considered pertinent because of its disclosure on a nitride semiconductor, fluorescent material, and a quantum well structure in the nitride semiconductor. Nihashi [6,580,215] is considered pertinent due to its discussion on a glass substrate and nitride layer. McIntosh [5,684,309] is considered pertinent due to its discussion on a stacked quantum well aluminum indium gallium nitride light emitting diodes. Schaff

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[2003/0173578] is considered pertinent due to its discussion on a substrate covered with nitride and quantum well structure. Starikov [2002/0074553] is considered pertinent due to its discussion on a substrate covered with nitride layer.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anthony Quash whose telephone number is (571)-272-2480. The examiner can normally be reached on Monday thru Friday 9 a.m. to 5 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John R. Lee can be reached on (571)-272-2477. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

A. Quash

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